

## WHAT IS CLAIMED IS:

1. A radiation-sensitive medium comprising hydrophilic polymer particles comprising
  - i. at least one thermally softenable hydrophobic polymer,
  - 5 ii. at least one hydrophilic polymer and
  - iii. at least one bonding compound capable of chemically bonding to the hydrophobic polymer and to the hydrophilic polymer.
2. The radiation-sensitive medium of claim 1, wherein the radiation-sensitive medium is  
10 hydrophilic when coated and dried, and becomes hydrophobic under the action of heat.
3. The radiation-sensitive medium of claim 2, wherein the radiation-sensitive medium is ineluable in aqueous media when coated and dried.
- 15 4. The radiation-sensitive medium of claim 3, wherein the aqueous media is one of water and fountain solution.
5. The radiation-sensitive medium of claim 4, further comprising a substance capable of converting radiation into heat.
- 20 6. The radiation-sensitive medium of claim 5, wherein the substance capable of converting radiation into heat is hydrophobic.
7. The radiation-sensitive medium of claim 5, wherein the radiation is infrared radiation.

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8. The radiation-sensitive medium of claim 7, wherein the infrared radiation has a wavelength between 700nm and 1200nm.
- 5 9. The radiation-sensitive medium of claim 4, wherein the hydrophilic polymer has a primary amine group,
- 10 10. The radiation-sensitive medium of claim 4, wherein the hydrophilic polymer is at least one of a saccharide, a chitosan polymer, a polyethyleneimine polymer, a polyamine polymer, a polyvinylamine polymer, a polyallylamine polymer, a polydiallylamine polymer, an amino(meth)acrylate polymer, a polyamide polymer, a polyamide-epichlorohydrin polymer, a polyamine-epichlorohydrin polymer, a polyamidepolyamine-epichlorohydrin polymer, a dicyandiamide-polycondensation product polymer and a copolymer thereof.
- 15 11. A radiation-sensitive medium comprising a hydrophilic polymer and at least one copolymer of a hydrophobic monomer and a bonding monomer, the bonding monomer being capable of chemically bonding to the hydrophilic polymer and to the hydrophobic monomer.
- 20 12. The radiation-sensitive medium of claim 11, wherein the radiation-sensitive medium is hydrophilic when coated and dried, and becomes hydrophobic under the action of heat.
- 25 13. The radiation-sensitive medium of claim 12, wherein the radiation-sensitive medium is ineluable in aqueous media when coated and dried.

14. The radiation-sensitive medium of claim 13, wherein the aqueous media is one of water and fountain solution.
- 5 15. The radiation-sensitive medium of claim 14, further comprising a substance capable of converting radiation into heat.
16. The radiation-sensitive medium of claim 15, wherein the substance capable of converting radiation into heat is hydrophobic.
- 10 17. The radiation-sensitive medium of claim 15, wherein the radiation is infrared radiation.
18. The radiation-sensitive medium of claim 17, wherein the infrared radiation has a wavelength between 700nm and 1200nm.
- 15 19. The radiation-sensitive medium of claim 14, wherein the hydrophilic polymer has a primary amine group.
- 20 20. The radiation-sensitive medium of claim 14, wherein the hydrophilic polymer is at least one of a saccharide, a chitosan polymer, a polyethyleneimine polymer, a polyamine polymer, a polyvinylamine polymer, a polyallylamine polymer, a polydiallylamine polymer, an amino(meth)acrylate polymer, a polyamide polymer, a polyamide-epichlorohydrin polymer, a polyamine-epichlorohydrin polymer, a polyamidopolyamine-epichlorohydrin polymer, a dicyandiamide-polycondensation product polymer and a copolymer thereof.
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21. A radiation-sensitive medium comprising at least one copolymer of at least two of a hydrophilic polymer, a hydrophobic monomer and a monomer that has a carboxylic group.
- 5 22. The radiation-sensitive medium of claim 21, wherein the radiation-sensitive medium is hydrophilic when coated and dried, and becomes hydrophobic under the action of heat.
23. The radiation-sensitive medium of claim 22, wherein the radiation-sensitive medium is ineluable in aqueous media when coated and dried.
- 10 24. The radiation-sensitive medium of claim 23, wherein the aqueous media is one of water and fountain solution.
25. The radiation-sensitive medium of claim 24, further comprising a substance capable of converting radiation into heat.
- 15 26. The radiation-sensitive medium of claim 25, wherein the substance capable of converting radiation into heat is hydrophobic.
- 20 27. The radiation-sensitive medium of claim 25, wherein the radiation is infrared radiation.
28. The radiation-sensitive medium of claim 27, wherein the infrared radiation has a wavelength between 700nm and 1200nm.

29. The radiation-sensitive medium of claim 24, wherein the hydrophilic polymer has a primary amine group.
- 5 30. The radiation-sensitive medium of claim 24, wherein the hydrophilic polymer is at least one of a saccharide, a chitosan polymer, a polyethyleneimine polymer, a polyamine polymer, a polyvinylamine polymer, a polyallylamine polymer, a polydiallylamine polymer, an amino(meth)acrylate polymer, a polyamide polymer, a polyamide-epichlorohydrin polymer, a polyamine-epichlorohydrin polymer, a polyamidopolyamin - epichlorohydrin polymer, a dicyandiamide-polycondensation product polymer and a copolymer thereof.
- 10 31. A radiation-sensitive medium comprising hydrophilic polymer particles, the hydrophilic particles being
- 15 a. hydrophilic to a substantial depth and
- b. comprised of hydrophilic polymer and at least one copolymer of a hydrophobic monomer and a monomer that has a carboxylic group.
32. The radiation-sensitive medium of claim 31, wherein the radiation-sensitive medium is hydrophilic when coated and dried, and becomes hydrophobic under the action of heat.
- 20 33. The radiation-sensitive medium of claim 32, wherein the radiation-sensitive medium is ineluable in aqueous media when coated and dried.
34. The radiation-sensitive medium of claim 33, wherein the aqueous media is one of water and fountain solution.
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35. The radiation-sensitive medium of claim 34, further comprising a substance capable of converting radiation into heat.
- 5 36. The radiation-sensitive medium of claim 32, wherein the substance capable of converting radiation into heat is hydrophobic.
37. The radiation-sensitive medium of claim 32, wherein the radiation is infrared radiation.
- 10 38. The radiation-sensitive medium of claim 37, wherein the infrared radiation has a wavelength between 700nm and 1200nm.
39. The radiation-sensitive medium of claim 34, wherein the hydrophilic polymer has a primary amine group.
- 15 40. The radiation-sensitive medium of claim 34, wherein the hydrophilic polymer is at least one of a saccharide, a chitosan polymer, a polyethyleneimine polymer, a polyamine polymer, a polyvinylamine polymer, a polyallylamine polymer, a polydiallylamine polymer, an amino(meth)acrylate polymer, a polyamide polymer, a polyamide-epichlorohydrin polymer, a polyamine-epichlorohydrin polymer, a polyamidopolyamine-epichlorohydrin polymer, a dicyandiamide-polycondensation product polymer and a copolymer thereof.
- 20 41. A radiation-sensitive medium comprising hydrophilic polymer particles, the particles comprising chitosan and at least one thermally softenable hydrophobic polymer, the
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coated and dried radiation-sensitive medium being ineluable in fountain solution and capable of becoming hydrophobic under the action of heat.

- 5           42.    A method for making a radiation-sensitive medium comprising polymerizing in the presence of at least one hydrophilic polymer at least one hydrophobic monomer and at least one monomer that has a carboxylic group.
- 10           43.    The method of claim 42, wherein the at least one hydrophilic polymer is one of a saccharide, chitosan, a polyethyleneimine polymer, a polyamine polymer, a polyvinylamine polymer, a polyallylamine polymer, a polydiallylamine polymer, an amino(meth)acrylate poloymer, a polyamide polymer, a polyamide-epichlorohydrin polymer, a polyamine-epichlorohydrin polymer, a polyamidopolyamine-epichlorohydrin polymer, a dicyandiamide-polycondensation product polymer and a copolymer thereof.
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- a.    polymerizing a styrene compound and acrylic acid in the presence of aqueously solubilized chitosan and
- b.    adding to the result of step (a) a substance capable of converting radiation into heat.
- 20           45.    A processless radiation-imageable lithographic printing precursor comprising a substrate and a dried and aqueous-ineluable coating of a radiation-sensitive medium on the substrate, the radiation-sensitive medium comprising:
- a.    a substance capable of converting radiation into heat; and
- 25           b.    hydrophilic polymer particles comprising:

- i. at least one thermally softenable hydrophobic polymer,
- ii. at least one hydrophilic polymer and
- iii. at least one bonding compound capable of chemically bonding to the hydrophobic polymer and to the hydrophilic polymer.

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46. The precursor of claim 45, wherein the coating is capable of becoming hydrophobic under the action of heat.

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47. The precursor of claim 46, wherein the substance capable of converting radiation into heat is hydrophobic.

48. The precursor of claim 46, wherein the radiation is infrared radiation.

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49. The precursor of claim 48, wherein the infrared radiation has wavelength between 700nm and 1200nm.

50. The precursor of claim 46, wherein the hydrophilic polymer has a primary amine group.

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51. The precursor of claim 46, wherein the at least one hydrophilic polymer is at least one of a saccharide, a chitosan polymer, a polyethyleneimine polymer, a polyamine polymer, a polyvinylamine polymer, a polyallylamine polymer, a polydiallylamine polymer, an amino(meth)acrylate polymer, a polyamide polymer, a polyamide-epichlorohydrin polymer, a polyamine-epichlorohydrin polymer, a polyamidopolyamine-epichlorohydrin polymer, a dicyandiamide-polycondensation product polymer and a copolymer thereof.

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52. A method for making a negative-working lithographic printing master, the method consisting of imagewise irradiating the processless radiation-imageable lithographic printing precursor of claim 51 with imaging radiation.
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53. A processless radiation-imageable lithographic printing precursor comprising a substrate and a dried and aqueous-insoluble coating of a radiation-sensitive medium on the substrate, the radiation-sensitive medium comprising:
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- a. a substance capable of converting radiation into heat; and
  - b. a hydrophilic polymer; and
  - c. at least one copolymer of a hydrophobic monomer and a bonding monomer, the bonding monomer being capable of chemically bonding to the hydrophilic polymer and to the hydrophobic monomer.
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54. The precursor of claim 53, wherein the coating is capable of becoming hydrophobic under the action of heat.
55. The precursor of claim 54, wherein the substance capable of converting radiation into heat is hydrophobic.
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56. The precursor of claim 55, wherein the radiation is infrared radiation.
57. The precursor of claim 56, wherein the infrared radiation has wavelength between 700nm and 1200nm.
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58. The precursor of claim 54, wherein the hydrophilic polymer has a primary amine group.
59. The precursor of claim 54, wherein the at least one hydrophilic polymer is at least one of a saccharide, a chitosan polymer, a polyethyleneimine polymer, a polyamine polymer, a polyvinylamine polymer, a polyallylamine polymer, a polydiallylamine polymer, an amino(meth)acrylate polymer, a polyamide polymer, a polyamide-epichlorohydrin polymer, a polyamine-epichlorohydrin polymer, a polyamidepolyamine-epichlorohydrin polymer, a dicyandiamide-polycondensation product polymer and a copolymer thereof.
60. A method for making a negative-working lithographic printing master, the method consisting of imagewise irradiating the processless radiation-imageable lithographic printing precursor of claim 59 with imaging radiation.
61. A processless radiation-imageable lithographic printing precursor comprising a substrate and a dried and aqueous-insoluble coating of a radiation-sensitive medium on the substrate, the radiation-sensitive medium comprising a hydrophilic polymer and at least one copolymer of a hydrophobic monomer and a monomer that has a carboxylic group.
62. The precursor of claim 61, wherein the coating is capable of becoming hydrophobic under the action of heat.
63. The precursor of claim 62, wherein the substance capable of converting radiation into heat is hydrophobic.

64. The precursor of claim 62, wherein the radiation is infrared radiation.
- 5 65. The precursor of claim 64, wherein the infrared radiation has wavelength between 700nm and 1200nm.
66. The precursor of claim 62, wherein the hydrophilic polymer has a primary amine group.
- 10 67. The precursor of claim 62, wherein the at least one hydrophilic polymer is at least one of a saccharide, a chitosan polymer, a polyethyleneimine polymer, a polyamine polymer, a polyvinylamine polymer, a polyallylamine polymer, a polydiallylamine polymer, an amino(meth)acrylate polymer, a polyamide polymer, a polyamide-epichlorohydrin polymer, a polyamine-epichlorohydrin polymer, a polyamidopolyamine-epichlorohydrin polymer, a dicyandiamide-polycondensation product polymer and a copolymer thereof.
- 15 68. A method for making a negative-working lithographic printing master, the method consisting of imagewise irradiating the processless radiation-imageable lithographic printing precursor of claim 67 with imaging radiation.
- 20 69. A processless radiation-imageable lithographic printing precursor comprising a substrate and a dried and aqueous-insoluble coating of a radiation-sensitive medium on the substrate, the radiation-sensitive medium comprising hydrophilic polymer particles, the hydrophilic particles being
- 25 a. hydrophilic to a substantial depth and

b. comprised of a hydrophilic polymer and at least one copolymer of a hydrophobic monomer and a monomer that has a carboxylic group.

5      70.      The precursor of claim 69, wherein the coating is capable of becoming hydrophobic under the action of heat.

71.      The precursor of claim 70, wherein the substance capable of converting radiation into heat is hydrophobic.

10      72.      The precursor of claim 70, wherein the radiation is infrared radiation.

73.      The precursor of claim 72, wherein the infrared radiation has wavelength between 700nm and 1200nm.

15      74.      The precursor of claim 70, wherein the hydrophilic polymer has a primary amine group.

20      75.      The precursor of claim 70, wherein the at least one hydrophilic polymer is at least one of a saccharide, a chitosan polymer, a polyethyleneimine polymer, a polyamine polymer, a polyvinylamine polymer, a polyallylamine polymer, a polydiallylamine polymer, an amino(meth)acrylate polymer, a polyamide polymer, a polyamide-epichlorohydrin polymer, a polyamine-epichlorohydrin polymer, a polyamidopolyamine-epichlorohydrin polymer, a dicyandiamide-polycondensation product polymer and a copolymer thereof.

76. A method for making a negative-working lithographic printing master, the method consisting of imagewise irradiating the processless radiation-imageable lithographic printing precursor of claim 75 with imaging radiation.
- 5 77. A processless radiation-imageable lithographic printing precursor comprising a substrate and a dried and aqueous-insoluble hydrophilic coating of a radiation-sensitive medium on the substrate, the radiation-sensitive medium comprising hydrophilic polymer particles, the particles comprising chitosan and at least one thermally softenable hydrophobic polymer, the coating capable of becoming hydrophobic under  
10 the action of heat.
78. A method for making a negative-working lithographic printing master, the method comprising the steps of:
- 15 a. providing a precursor comprising a dried and aqueous-insoluble coating of a radiation-sensitive medium on a substrate, the radiation-sensitive medium comprising hydrophilic polymer particles, the particles comprising chitosan and at least one thermally softenable hydrophobic polymer, the coating being hydrophilic and capable of becoming hydrophobic under the action of heat; and
- 20 b. imagewise irradiating the precursor with infrared imaging radiation of wavelength between 700nm and 1200nm.